The parameter Γ_{IF} which can be computed numerically and whose values are given in Figs. 1-3, enters into the equation for the amplitude of the periodic solution of Eq. (1) which is here presented for the case of a symmetrical period of variation of the function $\Omega(\xi)$ in initially defocusing planes (ID):

$$x_m = \sqrt{x_0^2 + \left(\frac{x_0' \beta\lambda}{\Gamma_{IF}}\right)^2} \sqrt{\frac{\Gamma_{IF}^{(0)}}{\Gamma_{IF}(\xi)}}, \quad (2)$$

where x_0 and x_0' are, respectively, initial elongation (in cm) and initial angle of the particle trajectory (in radians). Similar equations exist for the initially focusing planes (IF). Amplitude variations with rising N are shown in Figs. 4 and 5.

Card 6/15

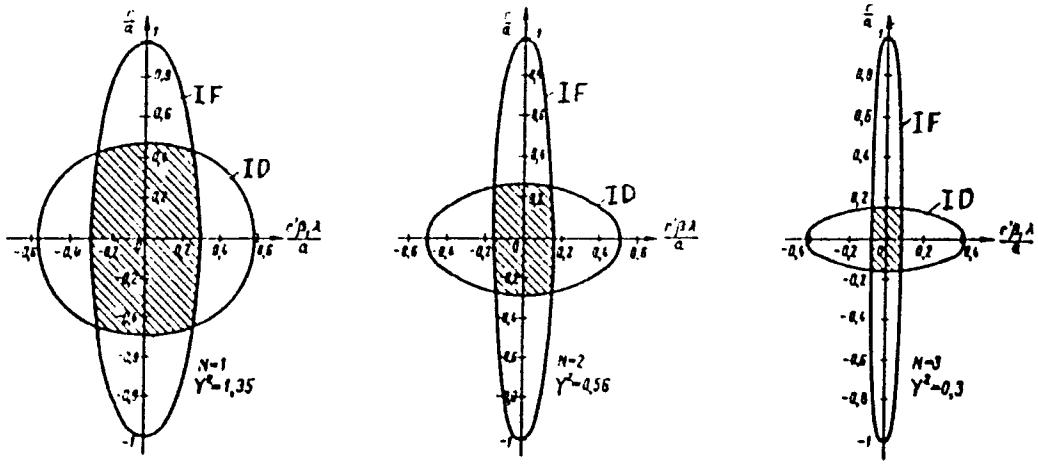

Fig. 4. Regions covered by parameters of entering beam for various values of N at $X^2 = 0.02$.

Card 7/15

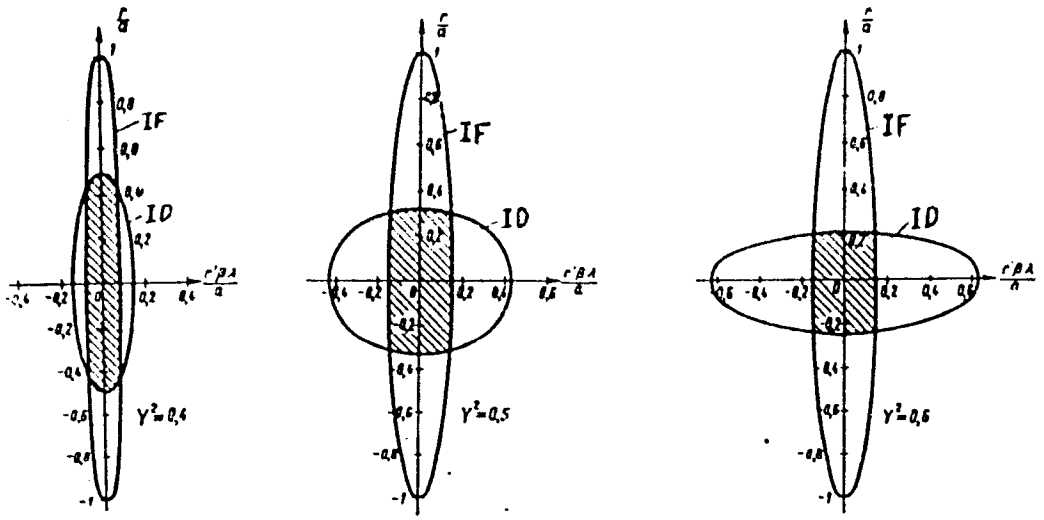

Fig. 5. Regions covered by parameters of entering beam for various lens potentials with $N = 2$ and $X^2 = 0.02$.

Card 6/15

As seen in Fig. 5, an increase of the lens potentials sharply reduces the region covered due to a increase of oscillation in the IB region (γ increases sharply). Calculations showed that the amplitude of radial oscillations increases with the increase of β, while $\Gamma_{IF}(\xi)$ in Eq. (2) decreases with an increase of ion velocities, provided the gradient is constant on lenses along the system. Numerical investigations of the ratio of amplitudes at the start and end of acceleration as function of the lens potential showed that the smallest rise in amplitudes is obtained for potentials close to the lower boundary of the stability region. A simultaneous variation of lens potentials with the ion velocities can keep $\Gamma_{IF}(\xi)$ unchanged and, consequently, keeps the amplitude constant. Calculation of a focusing system for a linear accelerator. The authors calculated a focusing system starting with the choice of the number of consecutive lenses of the same sign in drift tubes. From the stability

regions in Figs. 1-3 one determines for a given X^2 the value of Y^2 which for the given lens aperture determines the necessary focusing potential. Strong focusing studies were performed on a 5.5 mev linear proton accelerator with $\lambda = 2.18$ m; E = 20 kv/cm; $\beta_0 = 0.0328$; $\beta_f = 0.1$; $\varphi_s = 16^\circ$; k = 1; $\sigma_0 = 0.5$; $X_0 = 0.141$. The choice of 2a = 1.5 cm aperture, N = 2, and $Y^2 = 0.4$ fixes other parameters. Parameters of ellipses on the phase planes (see Fig. 5) are, for the ID plane:

$$\frac{x_m}{a} = \frac{1}{\gamma} = 0.5; \quad \frac{x'_m}{a} = \frac{\lambda f}{\beta \lambda} = 2.8 \cdot 10^{-2};$$

and for the IF plane:

$$\frac{x_m}{a} = 1; \quad \frac{x'_m}{a} = \frac{f}{\beta \lambda} = 1.4 \cdot 10^{-2},$$

where x' is angular divergence of the entering beam.

Lens construction. Of the two lenses constructed,

the one with an aperture of 2a = 1.5 and a 15 kv potential is shown in Fig. 6. Electrostatic lens has surfaces of a hyperbolic shape; the magnetic ones are cylindrical. Experimental investigations of the focusing system on the 5.5 mev linear accelerator. Calculations and construction were done at the beginning of 1955. First experimental results were obtained toward the end of 1955. Entering and outgoing beam currents were measured using a Faraday cage. Figure 7 shows some results. The 8 kv maximum agrees satisfactorily with calculations. The 15 mm aperture of the lenses trapped a beam of approximately 6 mm diameter as was calculated. Impulse magnetic lenses for the linear proton accelerator. Magnetic quadrupole lenses could be useful in cases of high-current beams. Calculations showed that for a 30 mev alternating gradient of a magnetic focusing linear proton accelerator with 4 mev injections, one would need a power of 250 kw. Since most linear accelerators work in impulses anyway, one can avoid many technical problems by feeding the lenses discontinuously. Using Eq. (4b),

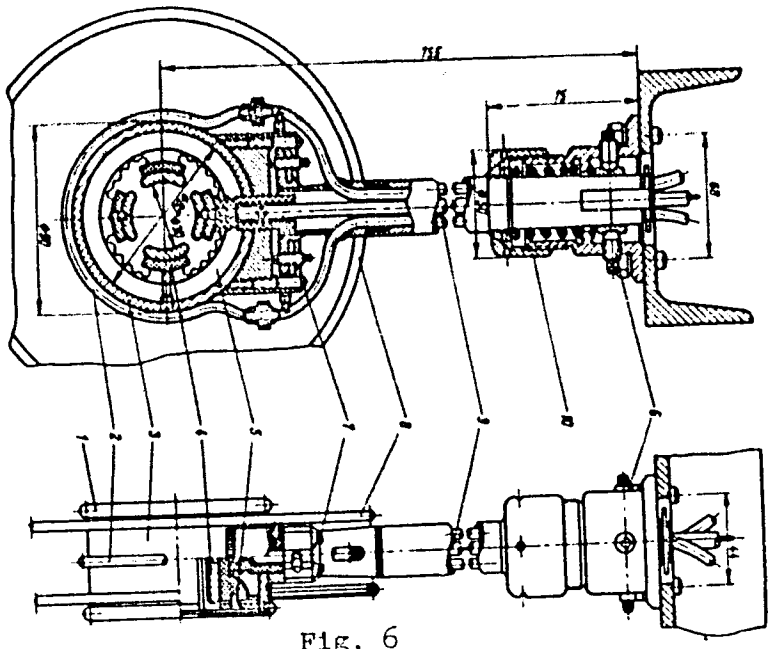

Fig. 6
(Caption on next card)

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Caption to Fig. 6

Fig. 6. Construction of electrostatic lenses with the drift tube: (1) diaphragm ring; (2) cooling loop; (3) body of drift tube; (4) lens electrodes; (5) lens insulator; (6,7) adjusting screws; (8) adjustment disk; (9) cables; (10) nut regulating height.

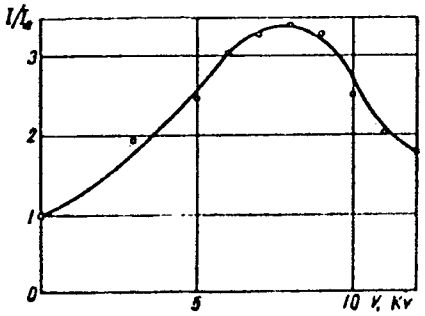

Fig. 7. Current on accelerator exit vs. lens potential.

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the authors obtain for the gradient of the magnetic field in the lens the expression:

$$H' = \frac{4mc^2\beta_0\gamma^2}{Ze300l_\pi}. \qquad (5)$$

They constructed the lens using transformer core material of thickness 0.35 mm. Three windings of PEV-2 wire of 2 mm diameter were covered with a layer of BF-2 glue, placed into the pole grooves, and baked. Such a coil was able to withstand current impulses of the order of 2 ka. For the 5.5 kev proton accelerator the authors needed $H' = 1.42 \cdot 10^3$ Oe/cm. This required per pole nI = 1,000 ampere turns, i.e., with a three-turn coil they needed approximately 300 a per pole or approximately 600 a per lens, and 12 ka for all the 20 lenses. The Hall effect in bismuth served for measurements of the field gradient. The system performed in a manner completely analogous to the electrostatic system. Professor K. D. Sinel'nikov (Member of the AS UkrSSR) and Ya. B. Faynberg

Strong Focusing in a Linear Accelerator

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SOV/89-8-2-7/30

(Candidate of Physico-Mathematical Sciences) showed constant interest and discussed the experiments. There are 7 figures; and 4 references, 1 Soviet, 3 U.S. The U.S. references are: L. Smith, R. Gluckstern, Rev. Scient. Instrum., 26, 220 (1955); T. Blewett, Phys. Rev., 88, 1197 (1952); E. Courant, M. Livingston, H. Snyder, Phys. Rev., 88, 1190 (1952).

SUBMITTED: April 27, 1959

Card 15/15

Conductivity of the plasma of a

transformer, the secondary circuit of which comprised the discharge tube. The voltage was reduced by the transformer in the ratios of 1:6 to 1:3. Discharge current and distribution of the magnetic field were measured with different voltages in the discharge tube. The topography of the magnetic field was measured with nine magnetic probes. The signals of these probes were observed with five OK-17M (OK-17M) double-trace oscilloscopes. According to the distribution of H_z and H_φ, the authors determined the current density, the electric field strength in the plasma, and the conductivity of the latter. They determined the intensity distribution of the H_γ lines of the Balmer series of hydrogen by a monochromator and a photomultiplier. Besides, they filmed the discharge with a movie camera. They found the density of charged particles in the plasma to be 10^{16} ions/cm^3. Fig. 1 shows that the conductivity of the plasma and the time of existence of a pinch decrease with increasing field strength. This behavior of the plasma can be explained by the theory developed by L. Spittser (L. Spitzer) (Fizika polnost'yu ionizirovannogo gaza (Physics of the fully ionized gas). IL, p. 97, 1957).

Conductivity of the plasma of a...

Another possible explanation for the found dependence of the electrical conductivity on the electric field is given by considering the interaction of electrons with neutral atoms, which practically always occurs in a discharge. From a certain temperature depending on the degree of ionization of the plasma, the electron interaction with neutral particles is shown to surpass the interaction with ions. The respective critical temperature was estimated to be 30 ev. V. D. Shapiro is mentioned. The authors thank K. D. Sinel'nikov, Academician of the AS UkrSSR, and Ya. B. Faynberg for discussions, as well as N. I. Rev, Degree Student at the Gosudarstvennyy universitet im. Gor'kogo (State University imeni Gor'kiy), for his help. There are 2 figures and 9 references: 4 Soviet and 4 non-Soviet. The two references to English-language publications read as follows: L. C. Burkhardt et al., Nature, 181, 229, 1958; Project Sherwood, Massachusetts, 209, 1958.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR Khar'kov
(Physicotechnical Institute AS UkrSSR, Khar'kov)

SUBMITTED: October 10, 1960

Card 3/4

ID 2000
26.2321

28778 S/057/61/031/010/011/015
B109/B102

AUTHORS: Suprunenko, V. A., Volkov, Ye. D., Reva, N. I., Sukhomlin, Ye. A., Burchenko, P. Ya., and Rudnev, N. I.

TITLE: Study of dynamics of a pinch in a magnetic field

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 10, 1961, 1246-1247

TEXT: The behavior of a pinch with respect to m = 1-type instabilities was investigated experimentally. Test arrangement: Discharge tube made of porcelain: Inner diameter 18 cm, length 42 cm, hydrogen filling ($p = 1.5 \cdot 10^{-2}$ mm Hg). Current source: 15-microfarad capacitor. Discharge period: 30 to 60 μsec. The discharge tube contained nine magnetic probes for determining the H_φ and H_z distributions. The measured values were recorded by five synchronized oscilloscopes OK-17M (OK-17M). Distribution of charge, current density, etc., were thus known for any point. Measuring results: The deviation amplitude of the discharge from the axis of the discharge tube is proportional to $\sqrt{E}$ (E - field strength), i. e., proportional to the current density (for measured values see Fig.3). The radial velocity of the discharge, that is also growing linearly with

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Study of dynamics of a...

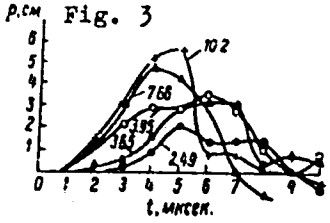
$\sqrt{E}$, shows the same qualitative behavior. V. D. Shafranov (Sb. "Fizika plazmy", t. 4, str. 130, 1958) is mentioned. There are 5 figures and 3 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR Khar'kov (Physico-technical Institute AS UkrSSR, Khar'kov)

SUBMITTED: January 31, 1961

Fig. 3. Deviation of the discharge from the tube center at different electric field strengths in the plasma. E varies between 10.2 and 2.49 v/cm. Abscissa: time in μsec.

Fig. 3



Card 2/2

30097
S/057/61/031/011/012/019
B125/B102

24.7311

AUTHORS: Rudnev, N. I., Suprunenko, V. A., Volkov, Ye. D., and Sukhomlin, Ye. A.

TITLE: Operation of controllable spark dischargers with parallel connection and in a short circuit

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 11, 1961, 1344-1349

TEXT: The present paper deals with the construction of a discharger (Fig. 1) and the delay of its wear as a function of the power of the igniting pulse (duration $> 10^{-3}$ sec) for a wide interval of interelectrode voltage. Two graphite-filled hemispheres (radius 60 mm) served as principal electrodes. The spark gap was fed from a battery consisting of ten capacitors. Fig. 2 shows the electric circuit of the spark gap. Its duration of wear Δt consists of the delay Δt_1 between the beginning of the pulse applied and the instant of spark-over on the ignition electrode, and the delay Δt_2 between the spark-over on the ignition electrode and the spark-over between the principal electrodes. Δt_1 which only depends on

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Operation of controllable spark...

the ignition voltage can be made smaller than 10^{-7} sec by a proper choice of the parameters of the ignition pulse. Special attention was paid to a reduction of power losses of the igniting pulse. Strong magnetic fields of great duration were generated by the circuit shown in Fig. 7. The pulses had rather a steep front with weakly sloping back side. The igniting pulse was formed by discharge of a 3-microfarad capacitor at 10÷40 kv over an auxiliary spark gap P_3. The spark gap operates quite accurately in the voltage range investigated. In some experiments on the reduction of inductivity of the bars, each capacitor of the battery has to be connected with the bus bar over a separate spark gap. In this case, the simultaneous response of all spark gaps is important. This is guaranteed by the fact that the igniting pulse reflected from the discharge interval arrives at the collector when the discharge over the other spark gaps has already begun. For dependable operation of the spark gaps with parallel connection, the voltage on the principal electrodes should not differ too much from the static spark-over voltage. Therefore, the interspace between principal electrodes should be quickly and accurately adjustable. There are 10 figures and 5 references: 3 Soviet and 2 non-Soviet. The two references to English-language publications read as

Card 2/4

Operation of controllable spark...

follows: J. D. Craggs, M. E. Haine, J. M. Meek, JIEE, 93, 963, 1946; A. M. Sletten, C. J. Lewis, Proc. IEE, 104, 54, 1957.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR Khar'kov (Physico-technical Institute of the AS UkrSSR Khar'kov)

SUBMITTED: January 27, 1961

Fig. 1. Discharger.

Fig. 2. Circuit diagram with ignition circuit.

Fig. 7. Short circuit diagram ("zakorotka").

Fig. 10. Circuit of parallel connection.

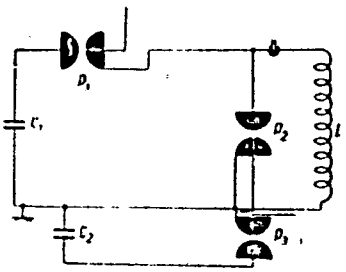

Fig. 7

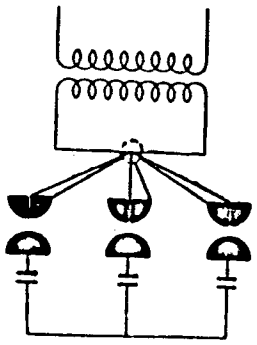

Fig. 10

Card 3/4

S/781/62/000/000/028/036

AUTHORS: Borisov, M. D. (deceased), Suprunenko, V. A., Sukhomlin Ye. A., Volkov, Ye. D.

TITLE: Investigation of stability of high-current discharge in hydrogen at low electric field intensities

SOURCE: Fizika plazmy i problemy upravlyayemogo termoyadernogo sinteza; doklady I konferentsii po fizike plazmy i probleme upravlyayemykh termoyadernykh reaktsiy. Fiz.-tekh. inst. AN. Ukr.SSR., Kiev, Izd-vo AN Ukr. SSR, 1962. 133-138

TEXT: A self-constricting discharge in a longitudinal magnetic field was investigated for stability in either a constant or programmed magnetic field, with a stabilizing screen used to increase the magnetic-field gradient on the discharge boundary, as called for by Suydam's criterion. The discharge was produced with a 15 microfarad capacitor bank with maximum stored energy 18.7 kilojoules. A rapidly alternating magnetic field was produced in the porcelain discharge chamber by a coper busbar loop, which served simulta-

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neously as a stabilizing jacket. The field distributions on the radius of the tube were measured with a magnetic probe, and the current density and electric field intensity were determined from the obtained distribution. At low field intensities, all distributions had two peaks along the radius, the second peak corresponding to the presence of a cylindrical conducting layer around the pinch. Large currents flow in this jacket, in spite of the low conductivity, because the electric field at that location is almost ten times larger than in the pinch. The pinch was found to be stable in these experiments up to 10 microseconds. When the electric field is increased, the double-peak distribution disappears and the results become similar to those obtained with the "Columbus-S-4" installation. The results showed good repeatability. It is concluded that the experiments with programmed field indicate the development of some type of instability under the influence of the alternating magnetic field, which lead to some magnetic-sound oscillations in the pinch. These oscillations prevent prolonged existence of large magnetic-field gradients on the pinch surface and the satisfaction of the Suydam criterion. There are 11 figures. The major western work referred to is by Tuck, Tayler, Suydam (in Russian translation) and Harrison (ref. 6, Phil. Mag. 1318-1325, 1958).

S/185/62/007/002/002/01(
D299/D302

14 673!

AUTHORS: Bolotin, L.Y., Suprunenko, V.O., Revuts'kyy, Ye.I., and Bomko, V.O.

TITLE: Design and construction of an accelerating system for linear strong-focusing accelerator

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 7, no. 2, 1962, 132 - 136

TEXT: A semi-empirical method is proposed for designing the accelerating system of a linear accelerator. This problem amounts to studying the distribution of the longitudinal electric field in the gap along the resonator axis and to determining the efficiency factors of the accelerating gaps. These factors are empirically found; they depend on the distribution of the field along the axis. It is assumed that the drift tubes are symmetrical. A comparison of the values of the period l_m, calculated by the approximate and the accurate method, showed that the approximate method is satisfactory. It is assumed that the length of the drift tubes is considerably

Card 1/3

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[illegible]

moderate values of [illegible]. Formula (8) was experimentally verified by the electrolytic-bath method. In conclusion, the obtained formulas can be used in practice. There are 2 figures, 1 table and 3 references: 1 Soviet-bloc and 2 non-Soviet-bloc. The reference to the English-language publication reads as follows: L. Smit and R.L. Gluckstern, Rev. of Sc. Instr., 26, 2, 220, 1955.

ASSOCIATION: Fizyko-tekhnichnyy instytut AN URSR (Physicotechnical Institute of the AS UkrRSR), Kharkiv

SUBMITTED: March 21, 1961

X

Card 3/3

ACCESSION NR: AT4036051 S/2781/63/000/003/0144/0150

AUTHORS: Suprunenko, V. A.; Faynberg, Ya. B.; Tolok, V. T.; Sukhomlin, Ye. A.; Reva, N. I.; Burchenko, P. Ya.; Rudnev, N. I.; Volkov, Ye. D.

TITLE: Coherent interaction of runaway electrons in a pinch

SOURCE: Konferentsiya po fizike plazmy* i problemam upravlyayemogo termoyadernogo sinteza. 3d, Kharkov, 1962. Fizika plazmy* i problemy* upravlyayemogo termoyadernogo sinteza (Plasma physics and problems of controlled thermonuclear synthesis); doklady* konferentsii, no. 3. Kiev, Izd-vo AN UkrSSR, 1963, 144-150

TOPIC TAGS: plasma pinch, plasma radiation, plasma ion oscillation, plasma electron oscillation, plasma compression, discharge plasma

ABSTRACT: The coherent radiation of transverse electromagnetic waves with frequency close to $\omega_0 (m_e/m_i)^{1/3}$ (ω_0 -- frequency of longi-

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ACCESSION NR: AT4036051

be coherent in the entire range of investigated initial gas pressures, with an intensity which is constant practically along the entire discharge length. The frequency of the electromagnetic radiation was found to be close to the plasma frequency and the power to exceed appreciably the power of thermal radiation from the plasma. The transformation of the longitudinal electrostatic oscillations into transverse electromagnetic waves can be attributed to the nonlinearity of the oscillations in the plasma due to the large amplitude, and also to boundary effects on the surface of the plasma pinch. Orig. art. has: 5 figures and 3 formulas.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 21May64 ENCL: 03

SUB CODE: ME NR REF SOV: 006 OTHER: 003

Card 3/6

SUPRUNENKO, V.A.

AID Nr. 981-5 3 June

COHERENT EM RADIATION FROM A HIGH CURRENT DENSITY PLASMA (USSR)

Suprunenko, V. A., Ya. B. Faynberg, V. T. Tolok, Ye. A. Sukhomlin, N. I. Reva, P. Ya. Burchenko, N. I. Rudnev, and Ye. D. Volkov. Atomnaya energiya, [redacted]14, no. 4, Apr 1963, 349-352. S/089/63/014/004/001/019

Results are given of experiments with plasma discharges at high current densities. Intense radial EM radiation was detected which was coherent and close to Langmuir frequency. Test apparatus included an alundum discharge tube, 10 cm in diameter and 25 cm in length, charged with H_2; aluminum electrodes, connected by a 15-μf capacitor bank charged to 30-40 kv and yielding a discharge current of about 100 kamp; an axial magnetic field variable from 0 to 10 kgs. Efforts to insure repeatability included the use of metal vacuum seals and a titanium pump, the baking of the apparatus at 300°C, and preionization of the gas mixture prior to discharging. Electric field gradients of 300-500 v/cm gave a high "runaway" electron condition in the discharge beam.

Card 1/2

AID Nr. 981-5 3 June

COHERENT EM RADIATION [Cont'd] S/089/63/014/004/001/019

This current was measured by means of a Faraday cell and a Rogovsky belt, both located at one electrode. A typical test result at a 8-kgs field strength and a 3-4-μsec plasma life showed that coherent EM radiation received by a horn antenna through the tube wall and detected over the 8-14.4-mm wavelength region was as much as 10^7 times more intense than thermal radiation from a plasma of 10-ev electron temperature, and was constant along the column. Coherence was detected by two probe antennas placed 11 mm apart in the column and connected to an 8-mm interferometer. Variation of the magnetic field from 0 to 8 kgs had no effect on observed radiation. Variation of other parameters revealed a sharply critical value of runaway electron current, below which radiation is absent and above which it rises rapidly in intensity accompanied by a dip in runaway current. This verified a casual relationship between the two. The relation of radiation intensity to initial gas pressures and to radial distance from the plasma column are also discussed. [SH]

Card 2/2

ACCESSION NR: AP4043982 S/0089/64/017/002/0083/0088

AUTHOR: Suprunenko, V. A.; Sukhomlin, Ye. A.; Reva, N. I.

TITLE: Ohmic heating and electrical conductivity of plasma in strong electric fields

SOURCE: Atomnaya energiya, v. 17, No. 2, 1964, 83-88

TOPIC TAGS: ohmic plasma heating, plasma electrical conductivity, plasma, strong magnetic field, electrostatic plasma instability

ABSTRACT: The authors have experimentally investigated in detail the conditions of excitation of electrostatic instabilites in a quasistationary discharge in a strong magnetic field, and their effect on the electroconductivity and heating of the plasma. The discharge currents reached 100 kamp. and the period 9 μ. sec. (the details of the experimental arrangement were described by V. A. Sy*pruchenko et al in Atomnaya Energiya 14, 349, 1961). Hydrogen and helium were used as discharge gases. The resistance of the discharge, the current produced by the "running away" electrons, microwave radiation of the plasma, and the elec-

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ACCESSION NR: AP4043982

tron temperature in the center of the discharge filament were measured. The density of the charged particles were determined by the stark effect broadening of the hydrogen-like lines. The authors found that at small electric fields, the resistance of the plasma is proportional to the square of the electric field, and after reaching the critical value of the field, increases rapidly. This critical field is proportional to the plasma density, inversely proportional to the electron temperature, and is independent of the nature of gas. "The authors are grateful to K. D. Smel'nikov and Ga. B. Fainberg for interest and constant help, and to O. S. Pavlichenk for help with the spectral measurements." Orig. art. has: 6 figures.

ASSOCIATION: None

SUBMITTED: 19Nov63 ENCL: 00

SUB CODE: EM, ME NO. REF. SOV: 013 OTHER: 007

Card 2/2

L 52161-65 EWT(1)/EPF(n)-2/EWG(m)/EPA(w)-2 Pz-6/Po-4/Pab-10/PI-4 IJP(c) AM/AT

[illegible] 001/002/0045/0049

AUTHOR: Sukhomlin, V. A.; Reva, N. I.; Suprunenko, V. A.; Tolok, V. T.

TITLE: Excitation and thermalization of electron plasma waves in a high-current gas discharge

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. [illegible]

TOPIC TAGS: plasma instability, plasma wave, plasma wave thermalization, plasma

ABSTRACT: Beam instabilities may heat plasma by means of the large eddy electric [illegible] in a high- [illegible] waves generated by the escaping electrons. From investigations of the conditions for the generation of beam instabilities in a current-carrying plasma it was found that with strong [illegible] energy supplied by an outside source is [illegible] to the development [illegible] the plasma [illegible] from the dis-

Card 1/2

L 52161-65
ACCESSION NR: AP5014202

charge. Measurements of the absolute values of the x-ray radiation intensity make [illegible] the magnitude of the plasma flux on the walls of the chamber. [illegible] fields at various plasma densities. They showed that there is an optimum value for the electric field in a plasma at which the heating of electrons is most effective, and that the heating of electrons is the result of the ~~ma~~lization of plasma waves in a gas discharge, with 0% of the energy supplied to the discharge going directly for heating. Orig. [illegible] [JA]

[illegible] Fiziko-tekhnicheskiy Institut Akademii nauk Ukrainskoy SSR (Physico-[illegible] Institute, Academy of Sciences, Ukrainian SSR)

NO REF SOV: 005 OTHER: 002 ATD PRESS: 4018

Card 2/2

L 7736-66 EWT(1)/EWT(m)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 DIAAP/IJP(c) AT

ACC NR: AP5025907 SOURCE CODE: UR/0057/65/035/010/1902/1905

44,55 14,55

AUTHOR: Aleksin, V.F.; Suprunenko, V.A.

ORG: none

TITLE: On the bremsstrahlung from a solid target in a plasma

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 10, 1965, 1902-1905

TOPIC TAGS: plasma diagnostics, x ray, bremsstrahlung, x ray absorption, Maxwell distribution

21,44,55

ABSTRACT: This paper is concerned with the plasma diagnostic technique which consists of observing the intensities of x rays passing through different absorbers after having been produced by plasma electrons striking a solid target. The energy flux of x rays behind the absorber is expressed as a sum, the terms of which relate to the different absorption edges of the absorber. Suitable formulas for these terms are given for a number of special cases. In calculating these formulas it was assumed that the angular distribution of the bremsstrahlung is either isotropic or is that given for a thick target of light elements by Sommerfeld (Proc. Nat. Acad. Sci. USA, 15, 393, 1929), that the plasma electron velocity distribution is either Maxwellian or is velocity independent over a finite range, and that the x-ray intensity is observed either normally to the target and the absorber or throughout the full hemisphere behind them. For a Maxwell distribution of the plasma electrons each term in

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ACC NR: AP5025907

the expression for the x-ray intensity depends on a single parameter which involves the thickness and absorption coefficient of the absorber and the temperature of the electrons. For the case of hemispheric observation and Maxwell distribution this dependence is presented graphically. Orig. art. has: 22 formulas and 2 figures.

SUB CODE: ME/ SUBM DATE: 28Dec64/ ORIG REF: 003/ OTH REF: 001

Card 2/2

L 28491-66 EPF(n)-2/ENT(1)/ENT(m)/ETC(f)/ENG(m) IJP(c) AT

ACC NR: AP6013116 SOURCE CODE: UR/0057/66/036/004/0620/0626

AUTHOR: Aleksin,V.F.; Suprunenko,V.A.; Shkhomlin,Ye.A.; Reva, N.I.

ORG: none

TITLE: Measurement of the electron temperature of a plasma with the aid of soft x-ray bremsstrahlung

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no.4, 1966, 620-626

TOPIC TAGS: plasma diagnostics, electron temperature, x ray technique x ray absorption bremsstrahlung, electron density

ABSTRACT: The authors discuss the determination of the electron temperature of a plasma by measuring the absorption curves of the soft x-ray bremsstrahlung from targets located within the plasma. The work was undertaken because difficulties were encountered in determining plasma electron temperatures from the bremsstrahlung emitted by the plasma itself, owing to the large effect of small high atomic weight impurities. Moreover, by the use of a target it is possible under favorable conditions to measure both electron temperatures and densities in different parts of the plasma.The calculations necessary to convert the x-ray absorption curves to electron temperatures are performed, using density and absorption formulas in the monograph literature, and the principal results are tabulated. The proper selection of target and absorber

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L 28491-66

ACC NR: AP6013116

materials is discussed; the significant factor is the location in the spectrum of characteristic radiations and absorption edges. To test the proposed technique, the authors measured the electron temperature in a magnetic field-stabilized linear hydrogen gas discharge in the apparatus described elsewhere by three of them (Atomnaya energiya, 17, 83, 1964). A 40 micron beryllium foil target was employed with beryllium and aluminum absorbers. The target was mounted in a short collimating side tube to protect it from fast electrons accelerated in the discharge field and from hard x rays from the electrodes. The x rays were detected with a scintillator, and the output from the photomultiplier was displayed on an oscilloscope. The x ray intensity decreased greatly when the beryllium target was replaced by a polyethylene film, indicating that the x rays came from the target and not from the plasma itself. The electron temperature was determined by comparing the observed absorption curves with calculated curves for different temperatures. The shapes of the observed and calculated curves were in good agreement, indicating that the electron distribution was close to Maxwellian. Both absorption curves gave the same electron temperature of slightly below 3 keV. The authors thank Academician K.D.Sinel'nikov of the AN UkrSSR for valuable discussions..Orig. art. has: 12 formulas, 7 figures, and 2 tables.

SUB CODE: 20 SUBM DATE: 25Dec64 ORIG. REF: 006 OTH REF: 007

Card 2/2

GRAN', N.I.; MYL'NIKOV, Yu.S.; SUPRUNENKO, V.G.

Short network and power resources of an electric 20,000 kv.-a. smelting furnace. Prom.energ. 16 no.6:34-36 Je '61. (MIRA 15:1)
(Electric furnaces)

ANDROSOV, N.S.; SUPRUNENKO, V.G.

Postoperative pulmonary atelectasis. Vest. khir. 93 no.8:12-17 Ag '64. (MIRA 18:7)

1. Iz khirurgicheskogo otdeleniya (zav. - N.S.Androsov) Murmanskoy oblastnoy bol'nitsy (glavnyy vrach - A.F.Pavlova).

SUPRUNENKO, V.K.

Biology of wild red clover in some districts of Vologda Province. Uch. zap. VGPI 27:113-156 '62. (MIRA 16:8)

(Vologda Province--Red clover)

SUPRUNOV, A., inzhener.

Improving the system of grinding three grades of flour. Muk.-elev.prom. 20 no.11:20-21 N '54. (MIRA 8:3)
(Grain milling)

SUPRUNOV, A.

SUPRUNOV, A., inzhener; ZINGER, Ye., inzhener.

Equip flour and groats mills with heating installations. Muk. elev.prom. 20 no.12:28-29 D '54. (MLRA 8:3)

1. Khar'kovskiy trest Glavmuki.
(Flour mills)

SUPRUNOV, A., inzhener.

Improved system of sieves. Muk.-elev.prom. 22 no.4:26-27 Ap '56. (MLRA 9:8)

1. Khar'kovskiy trest Glavmuki.
(Grain-milling machinery) (Sieves)

SUPRUNOV, A., inzhener.

Milling corn groats. Muk.-elev.prom. 22 no.10:28 O '56.
(MLRA 9:12)

1. Khar'kovskiy trest Glavmuki.
(Corn milling)

SUPRUNOV, A.

Removing straw and large impurities from grain. Muk.elev.prom. 23 no.9:15 S '57. (MIRA 10:11)

1. Khar'kovskoye oblastnoye upravleniye khleboproduktov.
(Grain--Cleaning)

SUPRUNOV, A., inzh.; SMORODINSKIY, A., inzh.; KHARAKHASH, V., inzh.

Installation of pneumatic transportation in the grain cleaning section of the Kharkov Flour Mill No.3. Muk.-elev. prom. 23 no.10: 16-19 O '57. (MIRA 11:1)

1. Khar'kovskoye oblastnoye upravleniye khleboproduktov.
(Kharkov--Flour mills) (Pneumatic-tube transportation)

SUPRUNOV, A., inzh.; KHARAKHASH, V., inzh.; MALYY, N., inzh.

Over-all mechanization in the packing department of the Flour Mill No.8 in Volchansk. A.Suprunov, V.Kharakhash, N.Malyi. Muk.-elev.prom. 24 no.3:18-19 Mr '58. (MIRA 12:9)

1. Khar'kovskoye oblastnoye upravleniye khleboproduktov (for Suprunov, Khardkhash). 2. Volchanskaya mel'nitsa No.8 (for Malyy).
(Volchansk--Flour mills--Equipment and supplies)

ZINGER, Ye., inzh.; SUPRUNOV, A., inzh.

Efficiency improvement at mills of the Kharkov Cereal Products Office. Muk.-elev. prom. 24 no.10:18-20 O '58. (MIRA 11:12)

1.Khar'kovskoye upravleniye khleboproduktov.
(Kharkov--Grain milling)

SUPRUNOV, A., inzh.; SHEKHTMAN, M., inzh.

Production of quality polished hominy at the Kharkov Milling Combine No.2. Muk.-elev.prom. 25 no.2:18-19 F '59. (MIRA 12:4)

1. Khar'kovskoye oblastnoye upravleniye khleboproduktov (for Suprunov). 2. Khar'kovskiy mel'nichnyy kombinat No.2 (for Shekhtman).

(Corn milling)

SUPRUNOV, A., inzh.; ZINGER, Ye., inzh.

Plan for a sack-repair shop at the granary. Muk.-elev.prom. 25 no.3:24-25 Mr '59. (MIRA 12:6)

1. Khar'kovskoye upravleniye khleboproduktov.
(Bagging) (Granaries--Equipment and supplies)

SUPRUNOV, A., inzh.

Mechanized drying, shelling, and sizing of corn seeds at grain procurement stations of Kharkov Province. Muk.-elev. prom. 25 no.10:17-18 O '59. (MIRA 13:3)

1. Khar'kovskoye upravleniye khleboproduktov.
(Corn(Maize)) (Kharkov Province--Grain elevators--Equipment and supplies)

SUPRUNOV, A., inzh.; KHARAKHASH, V.

Mechanization of standard granaries located away from railroads.
Muk.-elev.prom. 25 no.12:18-19 D '59. (MIRA 13:4)

1. Khar'kovskoye upravleniye khleboproduktov.
(Grain-handling machinery)

SUPRUNOV, A., inzh.; KHARAKHASH, V., inzh.

Plans for feedmilling sections of corn-processing plants. Muk.-elev. prom. 26 no.9:19-20 S '60. (MIRA 13:9)

1. Otdel mukomol'no-krypyanykh predpriatiy Khar'kovskogo upravleniya khleboproductov.

(Feed mills)

MAYMULA, V.; SUPRUNOV, A., inzh.

From brigades to enterprises of communist labor. Muk.-elev. prom. 26 no. 12:3-4 D '60. (MIRA 13:12)

1. Predsedatel' zavkoma Dnepropetrovskogo mel'nichnogo kombinata (for Maymula). 2. Khar'kovskoye upravleniye khleboproduktov (for Suprunov).

(Dnepropetrovsk--Flour mills)
(Kharkov--Flour mills)

SUPRUNOV, A., inzh.

General inspection of machinery and equipment at corn processing plants of Kharkov Province. Muk.-elev. prom. 27 no.2:17-19 F '61. (MIRA 14:4)

1. Khar'kovskoye upravleniye khleboproduktov.
(Kharkov Province—Corn (Maize))

SUPRUNOV, A., inzh.

Improve the structural features of the rosette in TK-580 grain cleaners. Muk-elev. prom. 27 no.6:24-25 Je '61. (MIRA 14:6)

1. Khar'kovskoye upravleniye zagotovok.
(Grain--Cleaning)

SUPRUNOV, A., inzh.

Stationary dryer for ear corn. Muk.-elev. prom. 27 no.8:18-19 Ag '61. (MIRA 14:7)

1. Khar'kovskoye upravleniye zagotovok.
(Corn (Maize)—Drying))

SUPRUNOV, A., inzh.; DMITRUK, Ye., inzh.

We have improved the cleaning of sacks in container repairing shops. Muk.-elev. prom. 28 no.2:28-29 F '62. (MIRA 15:3)

1. Khar'kovskoye upravleniya zagotovok.
(Grain handling--Equipment and supplies)

SUPRUNOV, A., inzn.

Flour for pretzels and bakery products. Muk.-elev. prom. 28 no.5:23-24 My '62. (MIRA 15:5)

1. Nachal'nik otdela mukomol'nykh predpriyatiy Khar'kovskogo upravleniya zagotovok.

(Flour)

SUPRUNOV, A., inzh.; GRISHKO, F.

Practices in the preparation of rye flour. Muk.-elev. prom. 28 no.10:13-15 O '62. (MIRA 16:1)

1. Otdel mukomol'nykh predpriyatiy Khar'kovskogo upravleniya khleboproduktov (for Suprunov). 2. Glavnyy inzhener Krasnogradskoy mel'nitsy No.30 (for Grishko).
(Rye) (Grain milling)

SUFRUNOV, A.

Volunteer Design Office at the Kharkov Department of the State Institute for Planning and Feed Mills and Grain Elevators. Muk.-elev. prom. 29 no.12:25-26 D '63. (MIRA 17:3)

1. Predsedatel' Soveta pervichnoy organizatsii Nauchno-tekhnicheskogo obshchestva Khar'kovskogo otdeleniya Promzernoproyekt.

SUPRUNOV, A.E., klinicheskiy ordinator

A rare case of spontaneous expulsion of bladder calculi with formation of a vesicovaginal fistula. Akush. i gin. 34 no.3: 106-107 My-Je '58. (MIRA 11:6)

1. Iz akushersko-ginekologicheskoy kliniki (zav. kafedroy - prof. Ye.S.Akopyan) Kubanskogo meditsinskogo instituta.

(BLADDER, calculi
spontaneous expulsion into vagina with form. of vesicovaginal fistula (Rus))
(FISTULA, VESICOVAGINAL, etiol. & pathogen.
spontaneous expulsion of bladder calculi into vagina (Rus))

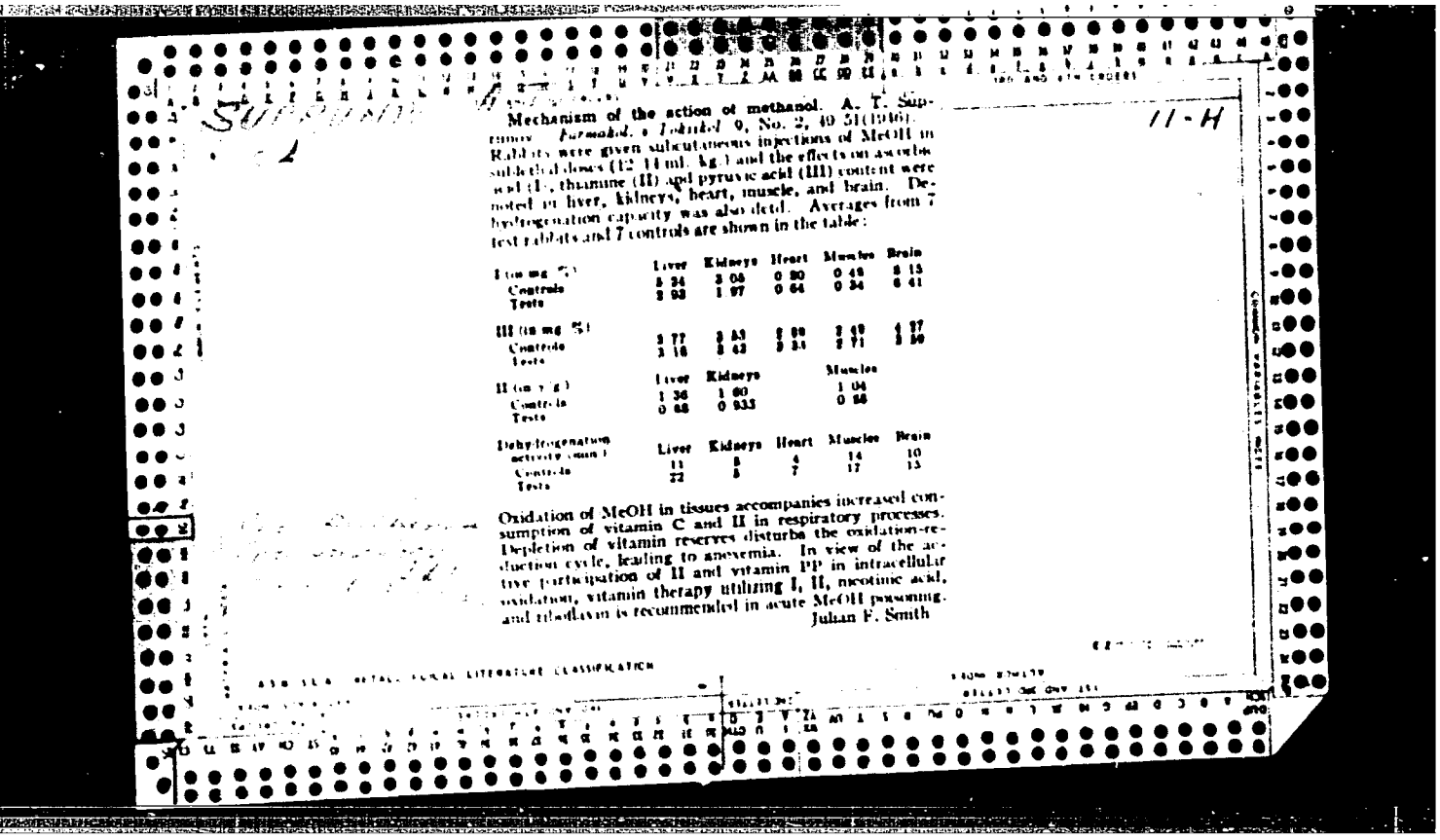
LABOVSKIY, M.S.; SUPRUNOV, A.S.

Designing turntable ball bearing for excavators and cranes.
Stroi. i dor. mashinostr. 4 no.1:25 Ja '59. (MIRA 12:1)
(Bearings (Machinery)) (Excavating machinery)
(Cranes, derricks, etc.)

SUPRUNOV, A.S., aspirant

Synthesis of a double-crank hinged six-bar linkage with a stop.
Izv.vys.ucheb.zav.; mashinostr. no.7:18-27 '63. (MIRA 16:11)

1. Odesskiy tekhnologicheskiy institut.



Mechanism of the action of methanol. A. T. Sapronov. *Farmakol. i Toksikol.* 9, No. 2, 49-51(1946). Rabbits were given subcutaneous injections of MeOH in sublethal doses (12-14 ml./kg.) and the effect on ascorbic acid (I), thiamine (II) and pyruvic acid (III) content were noted in liver, kidneys, heart, muscle, and brain. Dehydrogenation capacity was also detd. Averages from 7 test rabbits and 7 controls are shown in the table:

	Liver	Kidneys	Heart	Muscles	Brain
I (in mg. %)					
Controls	3.24	3.08	0.80	0.48	8.15
Tests	3.03	1.97	0.64	0.34	6.41
III (in mg. %)					
Controls	3.77	3.83	3.80	3.49	3.97
Tests	3.16	3.42	3.35	2.91	3.50
II (in γ/g.)	Liver	Kidneys		Muscles	
Controls	1.36	1.80		1.04	
Tests	0.68	0.933		0.86	
Dehydrogenation activity (min.)	Liver	Kidneys	Heart	Muscles	Brain
Controls	11	5	4	14	10
Tests	22	8	7	17	13

Oxidation of MeOH in tissues accompanies increased consumption of vitamin C and II in respiratory processes. Depletion of vitamin reserves disturbs the oxidation-reduction cycle, leading to anoxemia. In view of the active participation of II and vitamin PP in intracellular oxidation, vitamin therapy utilizing I, II, nicotinic acid, and riboflavin is recommended in acute MeOH poisoning.
Julian F. Smith

SUPRUNOV, A.T.; MURAVSKAYA, Z.A.

Method of assaying vitamin B_{12} in seawater. Trudy SBS 16: 463-466 '63. (MIRA 17:6)

ELPINOV, A.T.; MIRAVSKAYA, Z.A.

Vitamin B_{12} content in water of the Bay of Sevastopol and its possible ecologic significance. Trudy SBI 17:342-345 '64.
(MIRA 18:6)

NAVOZOVA, Fekla Vasil'yevna; SUPRUNOV, D.G., red.; KOFANOV, P.F., tekhn.red.

[The Krasnodar Territory] Krasnodarskii krai. Krasnodar, Krasnodarskoe knizhnoe izd-vo, 1955. 415 p. (MIRA 15:5)

(Krasnodar Territory)

SUPRUNOV, N., inzhener.

Rewarding work without accidents. Bezop.truda v prom. 1 no.5:38 '57. (MIRA 10:7)

1. Proizvodstvennyy otdel tresta Dzerzhinskruda.
(Industrial safety)

SUPRUNOV, N.I.

Pharmacognostic study of the ginseng root Panax Schinseng Nees
V.Ms. Apt.delo 8 no.6:30-34 N-D '59. (MIRA 13:4)

1. Iz Gornotayezhnoy stantsii Dal'nevostochnogo filiala imeni akad.
I.L. Komarova, Akademii nauk SSSR.
(GINSENG)

SUPRUNOV, N.I.

Pharmacognostic study of plants of the ginseng family (Araliaceae). Report No. 1. Mat. k izhuch. zhen'shenia i lim. no.4:216-221 '60. (MIRA 13:9)

1. Dal'nevostochnyy filial Sibirskogo otdeleniya AN SSSR.
(GINSENG)

SUPRUNOV, N.I.

Pharmacological study of the ginseng herb, Panax schinseng Nees V.Esenb. Apt. delo 10 no.6:28-35 N-D '61. (MIRA 15:2)

1. Gornotayezhnaya stantsiya Dal'nevostochnogo filiala imeni akademika V.L.Komarova AN SSSR.
(GINSENG)

S/200/62/000/011/004/008
D243/D307

AUTHORS: Brekhman, I. I., Bykhovtsova, T. L., Ratimov, B. N., Suprunov, N. I. and Fedorov, B. T.

TITLE: The first results of trials of preparations of the spiny Eleutherococcus in fur farming, poultry farming and bee-keeping

PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye. Izvestiya, no. 11, 1962, 123-128

TEXT: The present work extended the authors' previous investigations on the effects of Eleutherococcus. 200 minks, aged 4 months on September 3, 1961, received 1 ml/kg of fluid extract of Eleutherococcus root daily with milk. At death (November 28, 1961) their average weight exceeded that of controls by 92 g (8.1%) for males, and 57 g (7.1%) for females. Three treated animals died, as compared with 13 controls. Of the 123 animals treated, 57.4% had large pelts, 31.4% average and 23.2% small: control figures were 48%, 28.8% and 23.2% respectively. Pelt value increased by

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The first results of ...

5.3%. Liver and muscle glycogen, serum albumen and percent globulin rose and the albumen-globulin ratio fell from 1.55 to 1.40. In animals with 'wetting' disease, daily administration of 1 ml/kg Eleutherococcus root rapidly improved appetite and general condition and dried the affected parts of the pelt. Full recovery was reached after 3 - 5 days. The health and survival of incubator chicks was much improved after treatment with 1% solution of Eleutherococcus leaf extract. 0.5 to 2% solutions greatly increased appetite, mobility and activity, and led to earlier plumage and, in cocks, to earlier comb growth. 1 ml/kg Eleutherococcus root extract with the feed increased the weight of experimental birds, whose egg-laying capacity was also less affected by cold weather, being 2.2 times that of controls. Egg-laying began one month earlier and was more regular. The difference in the number of eggs during the experiment was 17.2% and the average weight of an egg increased by 13.5%. Bees given 0.5 - 2% solutions of Eleutherococcus root extract in sugar syrup developed faster, were more active, flew abroad earlier, flew in bad weather, and finished flying later, these effects increasing with concentration. Honey pro-

The first results of ...

S/200/62/000/011/004/008
D243/D307

duction was increased by 60% by giving a 2% extract of Eleuthero-coccus root and by 19% by a similar dose of leaf extract for 20 days. There are 2 figures and 2 tables.

Card 3/3

SUPRUNOV, N.I.

Pharmacognostic study of plants of the ginseng family. Mat. k izuch. zhen'. i drug. lek. rast. Dal'. Vost. no.5:193-200 '63.

Plants of the ginseng family as medicinal raw material. Ibid.:201-209 (MIRA 17:8)

1. Dal'nevostochnyy filial imeni Komarova Sibirskogo otdeleniya AN SSSR.

[redacted], N.V.

Anatomical study of plants of the ginseng family. Trudy Len. Khim.-farm. inst. no.17:223-244 '61. (MIRA 18:1)

1. Dal'nevostochnyy filial imeni V.L.Komarova Sibirskogo otdeleniya AN SSSR i Kafedra farmakognozii i botaniki Leningradskogo khimiko-farmatsevticheskogo instituta.

L 3-[illegible]-65

ACCESSION NR: AP5012199 UR/0243/65/000/004/0035/0037

14
12
12

AUTHOR: Suprunov, N. I.

TITLE: Technology of producing liquid extract from the roots of Eleutherococcus senticosus

SOURCE: Meditsinskaya promyshlennost' SSSR, no. 4, 1965, 35-37

TOPIC TAGS: Eleutherococcus senticosus, drug, solvent extraction

ABSTRACT: The roots of Eleutherococcus senticosus, an important raw product in the pharmaceutical industry, are difficult to extract because they contain a large mass of woody fibers. In a series of tests, raw, [illegible] and dried roots of the Eleutherococcus [illegible] were used to determine [illegible] a raw state [illegible] efficient, [illegible] characteristics [illegible] solvent was used to produce a fluid extract [illegible] from the dry powder. A

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L 62577-65
ACCESSION NR: AP5012199

2

diffusion battery of 6 containers proved most productive, with the maximum amount of desired constituents found in the sixth container. A smaller number of containers reduced the yield, possibly as a result of partial absorption by the raw material. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Gorno-tayezhnaya stantsiya Dal'nevostochnogo filiala im. V. L. Komarova Sibirskogo otdeleniya AN SSSR (Mining-Taiga Station of the Far Eastern Filial of the Siberian Branch AN SSSR)

SUBMITTED: [illegible] ENCL: [illegible] SUB CODE: LS, IC

NR REF SOV: 000 OTHER: 000

Card 2/2

SUPRUNOV, N.N., inzh.

Hoisting ore from quarries by means of skips. Mekh.trud.rab. 11 no.7:47 Jl '57. (MIRA 10:11)
(Quarries and quarrying)

SUPRUNOV, N.N.; BESPAL'CHIK, L.M.; TIMOFEYEV, V.M.; BEZLYUD'KO, A.I., otv. red.; YEROKHIN, G.M., ved. red.; NESTERENKO, V.I., red.; KUNIN, I.K., red.;

[Jet boring; studies] Termicheskoe burenie; sbornik trudov. Moskva, Nedra, 1965. 182 p. (MIRA 18:12)

1. Krivoy Rog. Institut "Giprorudmash."

SUPRUNOV, P.P. (Stavropol')

Manufacturing increasers by rolling. Vod.i san.tekh. no.9:31 S '59. (MIRA 12:12)
(Pipe fittings)

S/153/60/003/005/016/016
B013/B058

AUTHORS: Suprunov, V. A., Kisel'nikov, V. N.

TITLE: Effect of High-frequency Annealing on Structure and Corrosion Resistance of Austenitic Chrome-nickel Steels

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1960, Vol. 3, No. 5, pp. 947-951

TEXT: The effect of inductive high-frequency annealing on structure and corrosion resistance of austenitic chrome-nickel steels was studied in this paper. Industrial steel sheets of the grades 1Х18Н9Т (1Kh18N9T) and Х18Н12М3Т (Kh18N12M3T) were investigated. The chemical composition of these steels is tabulated. Specimens of 20х20х3 mm size were hardened by means of a high-frequency installation of the type ГЛ-3-10 (GL-3-10). Hardening was conducted at 850°, 1000°, 1100°, and 1300°C. The annealed specimens were ground, and submitted to the Vickers hardness test (Fig.1). It was shown that a correlation exists between conditions of thermal treatment and structure of the steels. The structure showed the highest amount of separated chromium carbides after hardening at 850°C (Fig. 2a);

hardening at 1100°C leads to a favorable distribution of the components (Fig. 2b); hardening at 1300°C results in grain coarsening (Fig. 2c). The corrosion resistance was tested in boiling 65% nitric acid (Fig. 3). It was established that the corrosion resistance of high-frequency annealed (1100°C) and subsequently quenched specimens was 2-3 times higher than their initial corrosion resistance. The specimens hardened at 1300°C showed a lower corrosion resistance (Fig. 4). This probably depends on the grain size. The corrosion resistance of steels in aggressive media depends on their electrode potential. This was measured by the conventional method of compensation (Fig. 5). The measurements showed that the initial potential is 0.9-1.0 v. At the beginning of the experiments, a potential jump was ascertained for 1Kh18N9T, in contrast to Kh18N12M3T. The potential dropped after 20-25 hrs, and in all experiments showed a rising tendency in the long run. This rise of potential can be traced back to the passivation of the specimen surface. The experiments thus showed that the hardness of high-frequency annealed steels changes according to a curve with a maximum at 900°C. I. N. Kidin is mentioned. There are 5 figures, 1 table, and 11 references: 8 Soviet, 1 German, and 1 US.

Effect of High-frequency Annealing on Structure and Corrosion Resistance of Austenitic Chrome-nickel Steels

S/153/60/003/005/016/016
B013/B058

ASSOCIATION: Ivanovskiy khimiko-tekhnologicheskiy institut, Kafedra tekhnologii metallov i kafedra protsessov i apparatov (Ivanovskiy Institute of Chemical Technology, Department of Metal Technology and Department of Processes and Apparatus)

SUBMITTED: January 5, 1959

Card 3/3

SUPRUNOV, V.A.; KISEL'NIKOV, V.N.

Effect of the heat treatment by a high frequency current on the corrosion of welded joints of steel 1Kh18N9T. Izv.vys.ucheb.-zav.;khim.i khim.tekh. 5 no.2:336-339 '62. (MIRA 15:8)

1. Ivanovskiy khimiko-tekhnologicheskiy institut, kafedra tekhnologii metallov i protsessov i apparatov.
(Steel—Corrosion) (Steel—Heat treatment)

SUPRUNOV, V.A.; KISEL'NIKOV, V.N.

Properties of iron powder-based pseudoalloys impregnated in glass melts. Izv.vys.ucheb.zav.;khim.i khim.tekh. 6 no.4:683-687 '63. (MIRA 17:2)

1. Ivanovskiy khimiko-tekhnologicheskiy institut. Kafedra tekhnologii metallov i kafedra protsessov i apparatov khimicheskoy tekhnologii.

ACCESSION NR: AP4037236 S/0153/64/007/001/0156/0163

AUTHOR: Suprunov, V. A.; Kisel'nikov, V. N.

TITLE: The intercrystalline corrosion of 18-8 type steel.

SOURCE: Ivuz. Khimiya i khimicheskaya tekhnologiya, v. 7, no. 1, 1964, 156-163

TOPIC TAGS: 18-8 steel, intercrystalline corrosion, corrosion, general corrosion, grain surface structure, heat treatment, element solution, hardness, tempering, annealing, phase precipitation, specific resistance, intercrystalline corrosion mechanism, rate, iron chromium ratio, manganese solubility, nickel solubility, iron solubility, chromium solubility

ABSTRACT: This study included an examination of the microdistribution of the grain surface structure of 18-8 type steels as affected by different heat treatment, a determination of the conditions leading to development of intercrystalline corrosion with time, and a determination of the relative amount of the elements going into solution during general and structural corrosion. 1Kh18N, 1Kh18N9T, 1KhN12M2T and 1Kh18NIIB steels were annealed at 850, 1000 and 1100C by conventional and induction heating and tempered at 650C. Intercrystalline corrosion was examined in

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ACCESSION NR: AP4037236

various solutions: (1) soaking in 20% HNO_3 + 1% NaF; (2) boiling in 65% HNO_3; and (3) boiling in H_2SO_4 acidified $CuSO_4$. The amount of general corrosion was determined by weight loss; and the amount of intercrystalline corrosion was determined by change in specific resistance. In structures tempered at 1100C the hardness is evenly distributed along the boundaries and basic background of the grain. After tempering at 650C, excess phases precipitated at the grain boundaries, increasing the hardness to 724-751 kg/mm^2. The process of intercrystalline corrosion growth can be divided into several stages, each having characteristic features. In the first stage the rate of general and intercrystalline corrosion are equal and cannot be distinguished by external features. In the second stage the rate of intercrystalline corrosion significantly exceeds that of general corrosion and they can be quantitatively divided. The third stage is characterized by precipitation of individual grains from the surface and a rapid rise in electric resistance. Group precipitation of the grains occurs in the fourth stage where the corrosion rate decreases due both to the corrosion products covering the intercrystalline area and to a retarding exchange between the solution and corroded surface. The breakdown mechanism by general and intercrystalline corrosion in 18-8 steels is different. The relative Fe to Cr content in the solution from general corrosion ranges from

ACCESSION NR: AP4037236

1.44 to 4.43. In the presence of intercrystalline corrosion this ratio reaches 18.5. Hence intercrystalline corrosion is characterised by transition of Fe into solution, and general corrosion, by more Cr going into solution. The Mn content in solution did not depend on the type of corrosion. The amount of Ni in solution decreased somewhat with an increase in annealing temperature. Orig. art. has: 4 figures, 4 tables and 1 equation.

ASSOCIATION: Ivanovskiy khimiko-tekhnologicheskiy institut, Kafedra tekhnologii metallov i protsessov i apparatov (Ivanovo Chemical Engineering Institute, Department of Metal Technology and Processes and Apparatus)

SUBMITTED: 28Apr63 ENCL: 00

SUB CODE: MM NO REF SOV: 006 OTHER: 004

Card 3/3

L 06345-67 EWP(k)/EWT(d)/EWT(m)/EWP(w)/EWP(v)/EWP(t)/ETI IJP(c) EM/JD/HW/WB
ACC NR: AP6030327 (A) SOURCE CODE: UR/0153/66/009/003/0502/0506

AUTHOR: Suprunov, V. A.; Kisel'nikov, V. N.

ORG: Chemical Machinery Department, Ivanovo Chemical Engineering Institute (Kafedra khimicheskogo mashinostroyeniya, Ivanovskiy khimiko-tekhnologicheskiy institut)

TITLE: Effect of welding stresses on the corrosion of weld joints of 1Kh18N9T steel

SOURCE: IVUZ. Khimiya i khimicheskaya tekhnologiya, v. 9, no. 3, 1966, 502-506

TOPIC TAGS: welding, thermal stress, stress corrosion, STEEL //Kh18N9T STEEL

ABSTRACT: An attempt was made to determine the effect of thermal stress and of the structural factor on the nature and rate of knife-line and general corrosion of a weld joint of 1Kh18N9T steel in 20% HNO_3+1%NaF and boiling 65% HNO_3. This steel was convenient to study because it has no tendency toward intercrystalline corrosion after being exposed for a short time to critical temperatures (450-850° during welding). The welding was carried out at 60, 80, 100 and 120 A with AN-20, TsL-2, TsL-11 and ENTU-3 electrodes. It was found that in addition to structural factors, which cause knife-line corrosion, the latter is also due to thermal and shrinking stresses. The character of the distribution of longitudinal and transverse thermal stresses in the weld joint was determined for various welding conditions. The highest values are reached at the fusion line, where the thermal and shrinking stresses combine. Specimens hardened with high-frequency currents did not show any signs of knife-line corro-

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sion after a 3-hour exposure to boiling 65% HNO_3. Orig. art. has: 5 figures, 1 table and 3 formulas.

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Card 2/2 mlE

KALISH, S[illegible]uil I[illegible]ovich; [illegible], Ivan [illegible]; [illegible], Konstantin Ivanovich; [illegible], Vitaliy Fe[illegible]ovich; [illegible], Boris Nikolayevich; PETRAKOV, Aleksandr Ivanovich; [illegible]ANSKIY, Yuzef Gilyar'yevich; MALAKHOV, S.M., retsenzent

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Boris Sergeevich Preobrazhenskii; 60th anniversary of birth. Vest. otorinolar., Moskva 14 no. 3:97-100 May-June 1952. (CLML 22:4)

1. Preobrazhenskiy is editor of Vestnik oto-rino-laringologii and attached to the Therapeutic Sanitary Administration for the Kremlin. Is Active Member of the Academy of Medical Sciences USSR. Awarded Order of Lenin in 1943. Is Chairman of the Administration of the All-Union Society of Otolaryngologists.

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1. Professor.

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*in Russia, otorhinolaryngol. aid to rural population)

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(CEREBROSPINAL FLUID,
penicillin, after intramusc. admin.)
(PENICILLIN, in cerebrospinal fluid,
after, intramusc. admin.)